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"Glimpses of the Wonderful": The Jamaican origins of the aquarium

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ABSTRACT

This study addresses the well-known history of Victorian naturalist Philip Gosse's popularisation of the marine aquarium through a new lens: the period he spent in Jamaica during the 1840s. Firstly, it reveals the importance of African-Caribbean collectors and naturalists to Gosse's natural history practise and shows the impact of racialized ethnographic perspectives on Victorian natural knowledge. Secondly, it argues that Gosse's observations of marine biology in Jamaica were significant for his developing ideas about examining and displaying sea creatures and informed his designs for British aquaria. Understanding Gosse's aquatic displays as archives of living bodies sets Gosse's contribution to Victorian aesthetic, museological and technological developments in the context of his natural history work in Jamaica.

KEYWORDS

Philip Gosse; natural history; aquarium; ethnography; race display; vision; spectacle; Caribbean; Jamaica

In the 1850s and 60s, an aquarium craze overtook Victorian Britain. The middle and upper classes flocked to the seaside to collect starfish, seaweeds, polyps and shells, bringing them home to populate their household "aqua-vivariums". Setting the trend was Philip Henry Gosse (1810–1888), a keen naturalist with a talent for science communication who published over 40 volumes on natural history in a long and successful career.[1] Though he was not the first to come up with the idea of keeping fish in glass tanks, Gosse helped to establish and stock the London Zoological Society's "Fish House" which opened in 1853, coined the word "aquarium" in 1854, wrote the first manual, *A Handbook to the Marine Aquarium* (1855), and was a principal figure in popularising these aquatic environments across the domestic, public and scientific spheres.[2]

Gosse has enjoyed a biographical revival in recent years. Historians have reclaimed his reputation as a naturalist from his public image as the stern, pious father of Edmund Gosse, vividly remembered in *Father and Son* (1907) as the figure who "kept the spiritual cord drawn tight."[3] Others have outlined the deep connection between his religious views and scientific interests in relation to the post-Darwinian revision of natural history.[4] But scholarship has not traced the important history of Gosse's major contributions to Victorian aquarimania and natural history to a crucial period in the development of his work: the time he spent living in Jamaica between October 1844 and June 1846. Gosse has long-

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since been honoured as "the father of Jamaican ornithology" for his *Birds of Jamaica* (1847) and the intricate, hand-coloured lithographic plates in the accompanying *Illustrations of the Birds of Jamaica* (1849).[5] Gosse's work on marine life on the South coast of England has been discussed at length, but the impact of Gosse's marine biology in Jamaica on the subsequent British aquarium craze remains unexamined.[6] My aim here is to reveal the West Indian coordinates of Gosse's aquatic interests by reading his earlier works, *A Naturalist's Sojourn in Jamaica* (1851) and his Jamaican manuscript journal from the 1840s on which the *Sojourn* is based, in conjunction with his later publications on the aquarium published in 1854 and 1855. Setting this reading in the context of the rapid expansion of new technologies of the moving image and the role of museological and theatrical modes of production in the popularisation of natural knowledge, this study establishes the lines of sight between Gosse's experience of the changing racial politics of newly-emancipated Jamaica and the aesthetic and technological developments of the marine aquarium as they were connected to the development of the Victorian sensorium through new models of visual perception. Gosse's aquarium is usually understood as a very British phenomenon associated with the Victorian parlour room and its visual displays of wealth and status. In fact, though, Gosse's work was heavily dependent on African-Caribbean naturalists and collectors. In seeking the archival traces of Black naturalists, this paper works toward an understanding of the transnational dimensions of nineteenth-century natural history. I show that Gosse drew on his Jamaican experiences in his engagement with the contemporary physiological understanding of vision and practices of natural history display. Ultimately, I argue, Gosse's Jamaican work and its associated ethnographic ways of seeing informed the production of the aquarium as a visual spectacle that collated marine life in an archive of living bodies. By focusing on the collecting and research impetus brought by the exploration of the Caribbean natural world and the social politics of nineteenth-century natural history practice in colonial settings, this study shows the racial and imperial underpinnings of Victorian natural knowledge and invites a consideration of how these structures ask us to understand natural history differently.

The Jamaican coordinates of Victorian natural history

A zealous naturalist from childhood after his aunt Susan Bell introduced him to natural history, Gosse was indentured as a clerk to a firm in Newfoundland in 1827 and spent a number of years living in Canada and America, where he became known as "that crazy Englishman who goes about collecting bugs."[7] Lynn Merrill writes that Gosse's "most valuable experience, because it had been the most intense, was, however, the thirty years he spent on the coasts of England."[8] But Jamaica, where Gosse enjoyed "the romance of the wild life; and the ever-recurring memory of it in after years," shaped his future work in important ways.[9] It is in Jamaica, I argue, that his passion for sea life helped him to develop his practice of "feasting […] the eager eyes as they gloat over the novelties" of the sea in ways that would later inform the conditions of nineteenth-century aquatic display.[10]

In 1844 Gosse left London for Jamaica with a plan to work for the natural history collector Hugh Cuming. Gosse lived at Bluefields, near Savanna-la-Mar, and spent his days collecting, recording, dissecting and drawing birds, animals, insects and marine life. He developed a successful collecting relationship with his West Indian servant, Samuel

Campbell (1827–1892), who was central to his natural history achievements, alongside other Black collectors who worked for Gosse or sold him specimens. He also collaborated with the naturalist Richard Hill (1795–1872) of Spanish Town. In the post-Emancipation era of the 1840s, Gosse found some of the human-made infrastructure of Jamaica in a state of "swift decay" as sugar estates went into receivership and buildings were abandoned when the credit system upon which the sugar industry was built could no longer take the strain of increasing numbers of heavily indebted planters.[11] This sense of social and economic decline is juxtaposed with the rich vitality of the Jamaican natural world, where the seasons bring change but "no cessation of animal or vegetable activity," and where the naturalist's "sense of novelty never palled."[12] Gosse's marine interests flourished in Jamaica's rich natural habitat; through the study of a species of whale, for example, "*which on no other occasion has fallen under scientific observation*."[13] Gosse successfully kept one of his first aquaria in Jamaica. The problem of oxygenation had been solved shortly before his Jamaican travels: in 1842, as Gosse knew, George Johnston had documented his practice of maintaining a balanced aquarium containing a coralline seaweed and various invertebrates.[14] In his Jamaican journal from 1844, Gosse records maintaining living marine worms in sea water "kept pure" with seaweeds and anemones.[15]

When and where Gosse produced his first aquarium design is unclear. An unpublished bound book of drawings from Gosse's time in Jamaica in the 1840s includes a drawing of an octagonal aquarium (Figure 1) bearing great similarity to the later "Fountain Aquarium" printed in 1854 (Figure 2).[16] The earlier image appears to be a sketch of the 1854 version: the pedestal is less ornate, but the fountain and sea creatures are almost identical in form and position to those in the later version. The book is titled "Jamaica Studies, 1844–46," and contains pencil and coloured sketches which were, in the vast majority, most likely drawn in Jamaica because of the species they represent – the bird *Nyctibius Jamaicensis*, the galliwasp lizard, and a flying fish, for example – as well as landscapes at Bluefields and Paradise River.[17] But the drawings have been cut out and stuck into the bound pages.[18] This leaves open the possibility that the aquarium sketch is from a later date: rather than drawing it while living in Jamaica, Gosse may have produced it closer to the publication of *The Aquarium: An Unveiling of the Wonders of the Deep Sea* in 1854. Given the successful oxygenated container Gosse sustained in Jamaica it is possible that he imagined his octagonal aquarium before the 1850s. But the sketch contains what appears to be a goose foot starfish, a species found off British coasts and included in the extraordinarily vivid chromolithographs in *The Aquarium* in 1854 (Figure 3), so it is perhaps more likely that the sketch was made in Britain and inserted into the collection of Gosse's genuine Jamaican drawings and paintings. Even so, the belated formulation of such a close relationship between the octagonal aquarium and Jamaican aquatic life points to a retrospective idea – on Gosse's part or on the part of his son, grandson or the British Library archivists – that the origins of Gosse's aquaria lay in his time collecting and observing in Jamaica.[19]

Gosse's manuscripts also show that Black Jamaicans were crucial to his collecting practice and were active participants in the production of the Jamaican natural history that went on to inform his longer-term work. His most important collecting relationship was with Samuel Campbell, a former slave who was Gosse's assistant, collaborator and constant companion.[20] In references to "Sam" which appear almost daily over the period of Gosse's residence in Jamaica between 1844 and 1846, the journal provides a detailed

Figure 1. Philip Gosse, "Fountain Aquarium," *Jamaica Studies, 1844–46.* Pencil sketch. © British Library Board. MS 89020/33.

record of Campbell's daily collecting practices, his successes and failures, and his impact on Gosse's work. As the Jamaican journal shows, Campbell was always either with Gosse or on solo collecting expeditions and was often the person whose persistence and inventive methods for catching reluctant fish, birds and insects meant he gathered the most significant specimens. It is Campbell who sets the fish pots and the "bird line," hunts insects and orchids, collects ferns, carries and skins specimens, and catches more fish

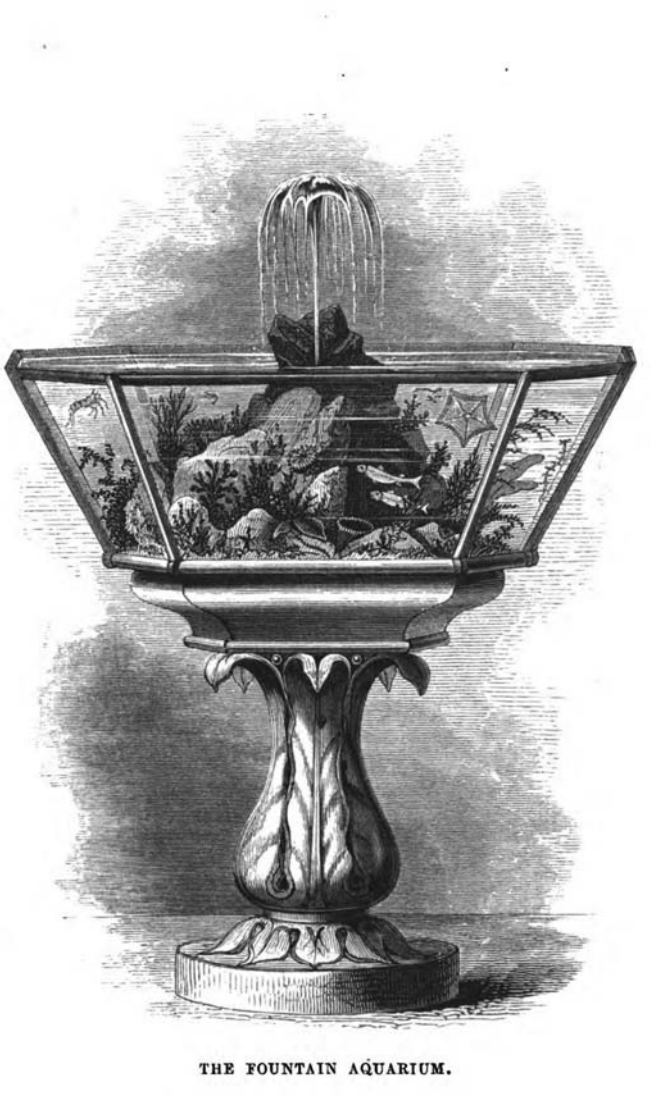

Figure 2. Philip Gosse, "Fountain Aquarium," *The Aquarium: An Unveiling of the Wonders of the Deep Sea*, second edition (1856). Chromolithograph. Courtesy of the British Library/Google Books.

than Gosse on his line.[21] Gosse frequently joins Campbell collecting specimens, but at other times stays home to describe and paint Campbell's discoveries. While Campbell is often sent to do more of the hard labour of collecting up mountains and in the sea than Gosse, he is also described in ways that appear to equalise their roles; both, for example, are portrayed as engaged in the task of "entomologizing," adding the distinction of epistemological labour to their collecting work.[22]

Campbell is acknowledged elsewhere in Gosse's published and unpublished archive. In *Birds of Jamaica* (1847) the importance of Campbell's contribution to Gosse's collection and classification of species is clear:

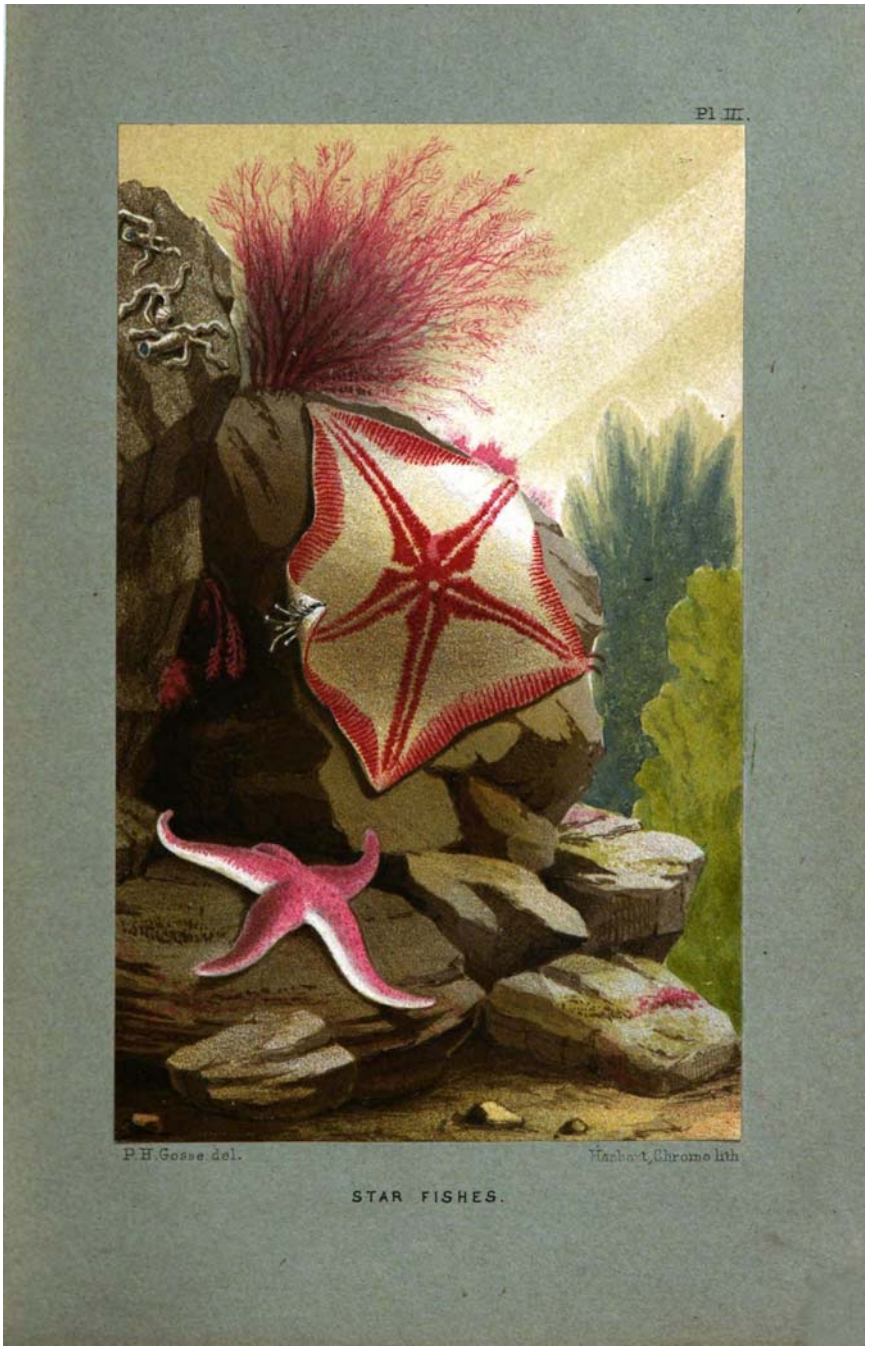

Figure 3. Philip Gosse, "Starfishes," *The Aquarium: An Unveiling of the Wonders of the Deep Sea*, second edition (1856). Chromolithograph. Courtesy of the British Library/Google Books.

his faithfulness, his tact in learning, and then his skill in practising the art of preparing natural subjects, his patience in pursuing animals, his powers of observations of facts, and the truthfulness with which he reported them, as well as by the accuracy of his memory with respect to

> species. […] He remained with me all the time I was in the island, and was of great service to me. Many of the subjects of this work were obtained by him, when I was not myself with him, and some which I believe to be unique.[23]

Campbell and other Black collectors are written into a letter defending the abilities of Gosse's assistants. When one of his white collectors believes the hunters working for Gosse are unable to differentiate rare from common butterflies, Gosse is quick to correct the mistake: "I have found persons of colour (my own negro youths, who served me when I collected in Jamaica) very quick to distinguish one butterfly from another and very true in recollecting the difference once they had observed it."[24] Gosse's affirmation of Campbell's unique specimens and his other assistants' significant body of knowledge shows the importance of African-Caribbean collectors to natural history in Jamaica and its international circulation.

Given the public esteem in which Gosse held Campbell and other Black naturalists and assistants, it is remarkable that nowhere in the published version of the *Sojourn* is Campbell acknowledged by name. The comparison between the manuscript and published versions of the *Sojourn* reveals striking differences. In an entry in his journal from December 1844 Gosse notes that he "had a pleasant ride, learning from an intelligent negro-boy, the names of the various trees."[25] In the published version, the knowledge Gosse gleans from the encounter has been erased:

> Some large bunches of crimson blossom caught my eye, far up above my head; and giving my horse to my negro guide, I climbed the rock to examine the plant. It was, as I had suspected, the elegant *Broughtonia sanguinea*, growing in profuse luxuriance in tufts, depending from the trunks of some Hog-plum trees (*Spondias graveolens*). […] On another tree, a species of *Bignonia*, I found masses of *Brasavola nodosa*, with long leaves resembling porcupine quills in form, and hanging racemes of elegant white flowers. I carefully detached all the specimens, greatly to the mystification of my sable companion; who, as I afterwards found, told his master how the "strange buckra had taken the trouble to get *parcel of bush!*"[26]

Appropriating the botanical knowledge of the "intelligent negro-boy," the passage is transformed into one in which Gosse asserts his white European authority. By allowing the African-Caribbean person to poke fun at him, Gosse mitigates the passage's true agenda: his satirical observation of the boy's ignorance of natural history practices and his own claims to superior knowledge.

In the *Sojourn*, African-Caribbean naturalists are notable for their visible invisibility. The text contains a strong but anonymised sense of Black Jamaicans working at the heart of natural history practice. In his narrative sketch of "a working naturalist's laboratory," Gosse begins: "In the room are three large tables, one of them against the window, at which a negro youth is sitting. Before him lie half a dozen *birds*, one of which he is skinning; beside him lie scissors, knives, nippers, forceps, a pepper-box of pounded chalk, a jar of arsenical soap, needles and thread, cotton-wool, and other apparatus."[27] Another Black assistant is described in his work extracting molluscs from their shells, while a third lays out botanical specimens to dry. Gosse gives the impression of assistants having a place at the heart of the working laboratory; it is only much later in this lengthy passage that we see "the naturalist himself" working alongside the others as he immerses beetles in boiling water.[28] Writing after what he calls the "dark days of slavery," Gosse gives his readers a glimpse of both the racial dynamics of fieldwork and an active laboratory in the era of

emancipation.[29] But the text does not reveal how crucial Black participants are to Gosse's collecting practice. Indeed, while Gosse reports on Jamaican fishing practices and expertise, and frequently cites the African-Caribbean names for particular species, the text also obscures and erases much of the work of Black naturalists.[30]

Biography, ethnography, zoology, empire

While the *Sojourn* does not acknowledge the importance of individual Black collectors to Gosse's work to the extent revealed in the unpublished journal, it does show the imaginative influence of Jamaica on Gosse's marine knowledge and later development of the aquarium. Gosse's Jamaican writings provide insight into the visual and creative foundations of his work on the aquarium and on his firmly held belief that life needed to be viewed within its natural environment – the core principle of his aquatic designs. Edmund Gosse writes in *Father and Son* that Philip "saw everything through a lens, nothing in the immensity of nature."[31] Certainly, Gosse was an important contributor to the development of "the microscopic standard of vision that so pervades the nineteenth century."[32] In his *Evenings at the Microscope* (1859), Gosse describes the "wonder-working instrument" as "the key which unlocks a world of wonder and beauty before invisible."[33] But Edmund's perception of his father's natural history practice as distanced from the natural world contradicts Philip's own account in which he claims that his work is defined by the urge to get closer to nature than the taxonomists holed up in the British Museum with nothing but "dry skins furred or feathered, blackened, shrivelled and hay-stuffed, bleached and shrunken, suspended by threads and immersed in spirit […] in glass bottles."[34] "Natural History," Gosse wrote in the *Sojourn*, "is far too much of a dead science; a *necrology*."[35] Situating himself in opposition to the metropolitan naturalists who studied the world through the cloudy lens of death, Gosse championed naturalism in the field, revelling in observing life in its environment and following Gilbert White's microcosmic model in his *Natural History and Antiquities of Selborne* (1789), from which he quoted White's assertion that "Every kingdom, every province, should have its own monographer."[36] The detailed observation of the milky fluid emitted by the porpita (a tropical marine organism that is similar in appearance to jellyfish) when it is handled, the frustration felt by the collector when elusive sea creatures and butterflies "*keep themselves just out of the reach of* [his] *net!*" and Gosse's model of science as the collection of "statistics as fresh and bright as the forest or meadow where they are gathered in the dewy morning" all testify to his fascination with the practice of natural history *in situ*.[37]

Indeed, Gosse presents an intimate view of nature, such as when he places sugar in his mouth to allow a hummingbird to suck it out, before the bird beats its head on the cage and has a fatal convulsion.[38] His descriptions are characterised by an interest in biographical accounts of living things going about their daily routines – the crab "seeking his breakfast," the "coquettish play" of the Anoles (lizards) and the visible "mental emotion … anger, or fear, or dislike" displayed by their changing colours.[39] Just as history is the "record of the actions of men" rather than a "description of their dead and preserved bodies," so too should natural history, Gosse writes, be a practice which "investigates and records the condition of living things, of things in a state of nature, their actions […] utterances […] affections and passions […] their arts and devices […] their connection with the inanimate world around them."[40] Revealing a variety of underwater

characters, the biographical natural history for which Gosse strives in his Jamaican work joins an interest in the emotional and social lives of animals to the microscopic investigation of the natural world.

This biographical lens is conjoined to an ethnographic one in a manner that reveals the colonial and transnational dimensions of Gosse's natural history. Gosse was in Jamaica between 1844 and 1846, several years after the apprenticeship system ended in 1838, and at a time of changing racial politics associated with the process of emancipation in the British West Indies. He had previously spent 13 years in North America, and his encounters with slavery during the eight months he spent in Alabama in 1838 are described in *Letters from Alabama* (1859). Gosse voices his abhorrence at witnessing enslaved people working in the cotton fields:

> It was revolting to me to observe women engaged in this laborious occupation, whose clothing – if the sordid rags which fluttered about them deserve the name – was barely sufficient for the claims of decency. Poor wretches! whose lot is harder than that of their brute companions in labour! For they have to perform an equal amount of toil, with the additional hardship of more whipping and less food. But perhaps you will say that I am not yet competent to speak on this subject: – perhaps I am not, therefore I defer it till a longer residence here has given me opportunities of more mature observation.[41]

While Gosse describes slavery as indecent and wretched, he defers any moral conclusion until he finds himself able to comment from a more "mature" perspective, and quickly shifts his gaze to "the wild and the free" in an account of a pair of vultures feasting on a pig carcass.[42] Resistant to seeing slavery, Gosse distracts himself and his reader by refocusing on his natural historical pursuits. Ultimately, the reality of doing natural history in the context of slavery becomes too much for Gosse:

> In spite of the beauty and grandeur of the country, the lucrative remuneration which a person of education receives for his talents and time, and the rich and almost virgin field for the pursuit of natural history (no small temptation for me), – I feel slavery alone to be so enormous an evil, that I could not live here: I am already hastening to be gone.[43]

The desire not to see terrible things evokes a different model of sight to the one Gosse takes up in the *Sojourn*. There, his muscular eye that both "commands a magnificent prospect" and "penetrates" as it "seems to go onward and onward interminably" – and which determines the keen vision of the naturalist and identifies natural historical vision with colonial acts of looking as an important form of cultural dominance in the colonies.[44] In Alabama, slavery is something he would rather not see, and Gosse claims his natural history practice is inhibited by the presence of such human evils. Adam Nicol shows, however, that the imbrication of science and slavery in the *Letters* reveals how Gosse's moral perspective evolves precisely through his natural historical lens. Nicol argues that Gosse's views on slavery are articulated through a delineation of the "dialectic of master and servant" in his accounts of slavery as a central element of the natural environment of the South.[45] Slavery, Gosse writes, is comparable to "a huge deadly serpent, which is kept down by incessant vigilance, and by the strain of every nerve and muscle; while the dreadful feeling is ever present, that, some day or other, it will burst the weight that binds it, and take a fearful retribution."[46] Nicol argues that Gosse views slavery as part of the natural "ecology" of the antebellum South, but Gosse's combination of observations of slavery's "horrors" with natural historical

detail also builds a case for rejecting slavery on the grounds of its disruption of the natural order.[47]

In the post-emancipatory era in Jamaica, Gosse's descriptions of African-Caribbean labourers are also bound up in natural history. These ethnographic accounts point to a significant connection between natural knowledge and racial observation, as the "biographical" approach to natural history extends into his interwoven accounts of Jamaican society and sea life, setting animal and plant life in its human contexts. Beginning a discussion of fishing with an account of a canoe trip to the market at Savanna-la Mar, Gosse describes in racist terms the busy scene on the beach as people prepare the canoes for departure:

> The jabber was immense;—a hundred negroes, many of them women, all talking at once make no small noise; and the white teeth were perpetually shining out in the sable faces, as the merry laugh—the negro's own laugh—rose continually. The figures of the women, many of them not ungraceful, though plump and muscular, were picturesque, clad in short gowns of showy colours, and wearing the peculiarly set handkerchief for a head-dress.

Enjoying the "novel scene" of people bustling around canoes, "tucking up their frocks still higher as the depth of the water increased," Gosse then climbs aboard his own canoe and his attention moves from human to marine life as he describes sea urchins, corals, starfish.[48] As the canoes arrive at Savannah-la-Mar, Gosse looks to the "rustic fair" of market day as people set about displaying their produce. Combining human and animal observation, he gives an account of the fishermen, the crustaceans they recover from the seabed, and the method they use for extracting the contents of the shells.[49] The description of the "picturesque" bodies of women on the beach alongside the fishermen's labour and the details of sea life merge to create a sense both of natural history practice in human context and of the imbrication of scientific and racist observation.[50]

Another passage combines African-Caribbean and animal bodies in a manner that appears to enact their joint examination as natural objects:

> I observed with delight the brilliant colours and strange forms of fishes that had just been caught; among which, however, was a young shark, some three or four feet long, and not yet dead. Three brawny negroes were on board, whose dark brown skins, plump and glossy, were only partially concealed by their ragged garments; yet one of these was the pilot, to whose skill and local knowledge we were to be indebted for a safe guidance among the kays, and through the coral channels, that guard the magnificent harbour of Kingston.[51]

This passage objectifies the men, while also praising the pilot's significant knowledge of the Jamaican marine environment. In the manuscript version, Gosse pays more attention than he does in the *Sojourn* to African-Caribbean knowledge and cultures. One entry begins with Campbell in the laboratory "preparing" some crabs he has collected and Gosse out gathering water scorpions, but abruptly switches to an account of West African-derived naming practices:

> The names we often see in tales applied to Negroes, Quashy, Cudjoe, are not promiscuously applied, nor are they meaningless. They indicate the day of the week on wh. the individual was born, & being as they doubtless are heathen & African in their origin, afford an interesting illustration of a weekly division of time in Pagan nations [there follows a long table of the female and male names by days of the week].[52]

Gosse's manoeuvre from the marine to the ethnographic blurs the boundary between the two, dehumanising Black people by making them objects of knowledge rather than individuals. His accounts of animal specimens, in both Alabama and Jamaica, are intertwined with heavily racialized observations of local people, presenting natural history as part of the work to understand people and places beyond Britain in a way that served a colonial project that, despite abolition, was still very much in full force.

Nature in context

Gosse's biographic and ethnographic interests, and the Atlantic coordinates of his natural knowledge, can be seen both in his later writings on the aquarium and in the broader culture of aquaria and other natural displays in Britain. The exotic creatures on show in zoos and menageries were an important part of the culture of imperial display. Scholarship on nineteenth-century natural history has emphasised the importance of colonial connections and contexts to the ways in which animal exhibits were constructed. Harriet Ritvo has shown that colonial collections "supported and validated the routinized day-to-day domination of empire," while Helen Cowie writes that "zoos and menageries were emblems of the British Empire in miniature."[53] Aquaria did not function in quite the same way: the sea life in Gosse's British tanks in the 1850s was not tropical. Rather, Gosse's *Aquarium* is a guide to keeping and viewing the periwinkles, prawns, and seaweeds found on British shores. There are some records that show the presence of tropical sea life in Britain: the physicist and chemist Michael Faraday performed a public experiment with an electric eel imported from South America in 1838. But until the advent of air travel and methods of pumping, filtration and heating it was even more difficult to convey healthy fish or coral across the Atlantic than it was to transport a monkey or a sloth.

Nevertheless, Gosse's aquatic displays completely changed how sea life was experienced in British museological and zoological spaces. Before 1852, the aqua-vivarium was usually a cylindrical glass container resembling a "cabinet" which might be used to keep "a few fish or an invertebrate, in the possession of a few naturalists who regarded it as too insignificant to write about."[54] Anna Thynne is credited with being "the first person to have made the aquarium into a world apart in miniature – and, moreover, to have used it for a programme of experimentation." But Thynne's work lay in understanding the madrepore coral – she did not share Gosse's interests in using the aquarium as a form of display.[55] The London Zoo Fish House (1853) that Gosse helped to create represented a departure from previous displays of aquatic life. William Bullock's London Museum in the Egyptian Hall, Piccadilly, for example, had offered the public the chance to see a wide range of stuffed animals in a setting designed to evoke their native habitats. Fish, shells and coral are listed in the exhibition records, but these were not living at the time of their display, as two images of the Egyptian Hall show – one of Bullock's London Museum (Figure 4) and another that shows either the London Museum, which occupied the Egyptian Hall for ten years from 1809, or the display in the Egyptian Hall with which Bullock replaced it in 1819 (Figure 5). The latter image reveals a lifeless shark suspended from the ceiling, in stark opposition to the living, moving display of Gosse's aquarium.[56] Bullock's spectacular natural displays were intended to give the viewer a fuller impression of animals in their natural environment to that offered by the more conventional museum exhibits of stuffed animals on shelving or in glass cases. Bullock wrote that his animals

Figure 4. Thomas Hosmer Shepherd, "Bullock's Museum, (Egyptian Hall or London Museum), Piccadilly: the interior" (1810). Coloured Aquatint. Courtesy of Wellcome Collection. CC BY 4.0.

were "exhibited as ranging in their native wilds and forests" with "all the appearance of reality," and "the whole being assisted with a panoramic effect of the distance and appropriate scenery, affording a beautiful illustration of the luxuriance of a torrid clime."[57]

But Bullock's focus on "curiosities" and novelty of scene, alongside the display's accompanying anecdotes about specimens – a fish, for example which was "kept for three days out of water, and which walked about the house in the manner of a dog" – were in some senses far removed from Gosse's natural history aims.[58] Gosse's exacting sense of detail made him dissatisfied with the style of preservation employed in museums. The *Naturalist's Sojourn in Jamaica* voices Gosse's preference for preservation "in a natural form": he dries a marine mollusc called a chiton, for example, "exactly in the position it would have assumed when alive on the rock," rather than manipulating it into one of the unnatural poses in which such specimens were to be found in museum cabinets.[59] This argument engaged with taxidermical and taxonomical debates about how to reinvest animal bodies with a sense of "life" once they had been received by large metropolitan museums. The fragility of dead specimens also posed a serious problem for naturalists. After collecting millipedes, Gosse writes: "[b]y the time I arrive at home, I commonly find the specimens, collected an hour or two before, completely disintegrated, the box presenting only a heap of fragments; and those segments that remain entire, separating at the slightest touch."[60] This posed particular difficulties for taxonomists who had never seen the creatures in life.[61] It was also especially significant in the collection of sea creatures – jellyfish, for example, begin to wither and lose their shape from the moment they

Figure 5. William Benjamin Sarsfield Taylor, "Interior of the Egyptian Hall, Piccadilly," c.1815-25. Aquatint. Courtesy of Westminster City Archives.

are collected. Unlike the stiffened and contrived postures of museum specimens, the aquarium was able to reveal animal behaviours and environments, taking the idea that animal displays should be embedded in "all the appearance of reality" much further than Bullock or other museum displays had been able to.[62] As one French observer wrote after the Jardin des Plantes in Paris followed the example of Regent's Park and installed a public aquarium in 1859:

> modern science, not less ingenious in its popularizing processes than patient and bold in its investigation of the secrets of nature, has found a means of opening up to us the wondrous scenes of the submarine world. She has created small oceans in miniature, tiny seas for our domestic chambers, wherein, through walls of crystal, we may watch the fish, the crustaceans, the molluscs, and the zoophytes living their normal life in the bosom of the 'briny wave' among rocks, and coral, and seaweeds.[63]

It is the desire to observe and display a representative sample of "normal life" in its habitat that underpins Gosse's intertwining of marine and ethnographic knowledge.

The aquarium enjoyed a life at the centre of the London Zoological Society and as an "ornament from nature" in the middle-class parlour.[64] But, as the Victorian gardening writer Shirley Hibberd wrote, the aquarium's purposes went far beyond the scope of the decorative: it was "at once an ornament, a toy, a cabinet, a menagerie, a *Jardin des plantes*, a Botanico-Zoological picture, in which every colour has life; in short 'a thing of beauty and a joy forever.'"[65] In his own account of the epistemological and cultural labour performed by the aquarium, Gosse explicitly invokes the model of "biography," both in the sense of uncovering new knowledge in light of the fact that "[t]he inhabitants

of the deep sea have been almost inaccessible to such observation as this" and because of the attention he wishes to draw to individual specimens – their "affections and passions" and "arts and devices."[66] Rather than a project structured by a classificatory zoological approach, Gosse's work stood out for its holistic visualisation of marine life. The public aquarium in Regent's Park, as well as Gosse's smaller octagonal and rectangular designs, presented an entirely different kind of environment for a collection of specimens which were presented as an "aquatic community" precisely through the kinds of ethnographic lens Gosse had developed in Jamaica.[67] In the *Sojourn* a section on "fishes and fishing" begins with a "magnificent picture" of a Caribbean storm over the sea, before transposing it with an account of Gosse accompanying a fisherman in his canoe, the view of the sea as they travel, the appearance of "specks" on the horizon which are then revealed as fish pots, the construction of the fish pots, the specimens captured, a close-up account of their colours, form, scales and Latin names, before the view draws out again to show the mangrove shore and the Dolphin Head Mountain range. The passage concludes with a walk from the beach and a proto-ethnographic account of Black labourers pulling fishing boats onto the shore.[68] The movement from a broad sweep of landscape to the tight focus on anatomical structures, and then onwards to human relationships to nature, characterises Gosse's approach to visualising sea life in its fullest natural and social contexts. The connection between the natural historical and the proto-ethnographic also connects different forms of vision that implicate the production of multiple forms of knowledge: the instruction of the microscopic, the aesthetic sensibility of landscape, and the ethnographic surveillance of Black bodies. Such forms of looking are those that inform the development of the aquarium, where Gosse's "aquatic community" implicitly draws on imperial structures of knowledge and observation.

The archive of the living body

In the aquarium, Gosse's "aquatic community" was on public display, rendering living nature even more spectacular through the beautiful glass creations in which it was viewed. The aquarium, I argue, was a unique form of natural historical display that functioned as an archive of living bodies, or what a review of the Fish House at London Zoo called a "museum of living nature."[69] My term "archive" draws on Gosse's biographical examination of specimens and their behaviours, and indicates the aquarium's preservation of a sample of marine life. But alongside biography the aquarium must also be considered through the other forms of discourse and representation Gosse employs, particularly in relation to contemporary cultures of display. Popularised during the era of nineteenth-century scientific spectacle and a cornucopia of new visual technologies, Gosse's aquaria embodied changing ideas about processes of perception and modes of lifelike or realistic display. Distancing itself from other forms of animal displays in museums, the aquarium functioned as a gallery of moving images, carefully curated to reveal the fascinating behaviours of sea life. These two models for thinking about the aquarium – as an archive of living bodies and as a gallery of moving images – provide a starting point for considering it in the context of nineteenth-century display culture and in relation to Gosse's Jamaican fieldwork.

In the wake of the early nineteenth-century shift away from classical models of vision which Jonathan Crary has argued was "inseparable from a massive reorganization of

knowledge and social practices," Gosse participated in the new "physiological optics" that emphasised the corporeal processes of apprehending the visible world.[70] Gosse helped to develop a new kind of "observer" whose ways of looking were shaped by an enormous variety of new visual technologies, of which the aquarium was one.[71] The new octagonal aquarium design, in particular, offered a mobile viewing experience which enabled viewers to walk around it in the effort to get a better glimpse from a variety of angles of the moving life within. Lynda Nead shows how the nineteenth century witnessed a "transformation from stasis to movement" across the entire range of visual media, including painting, stage magic, lantern pictures, astronomy and, ultimately, film and photography. Gosse had already articulated the centrality of movement to visual experience in his Jamaican work, which drew explicitly on the discourse of public spectacle and display before his aquarium designs were introduced to the public. The *Sojourn* emphasises the "panoramic effect" he strives to create in his writing "so that the reader might have before his mind a succession of pictures."[72] Like William Bullock in his Egyptian Hall, Gosse connects his natural historical aims to the panoramas that had captured the imagination of the viewing public, marking a "fundamental shift […] in the logic and focus of representation" and holding up the illusion of reality as their prime objective.[73]

The idea of a sequential process of vision contained in Gosse's "succession of pictures" might suggest the *Sojourn* invokes not only the visual model of the panorama but also other forms of display such as the magic lantern and its series of slides. As Gosse describes walking towards the water near Bluefields on the South coast of Jamaica, he draws the reader's eye with him as he moves across the sand to the shallows, wading in past rocks, corals and parasites, then deeper to examine starfish, small and then larger fish, adding layers of new imagery in the attempt to share with the reader the feeling of "delightful excitement with which [he] gazed around, bewildered and entranced, almost, with the variety of charming objects, all at once appealing for attention."[74] Operating on the cusp of visual regimes of attention and distraction, Gosse's sequential narrative resists the temptation to become overwhelmed by the tropical visual experience. Just as magic lantern displays were often "carefully staged and sequenced in order to captivate their audiences with attentive rather than distractive regimes," Gosse's visual sequence creates order from natural variety, structuring vision around the moving body of the observer.[75] His sense of wonder emphasises the power of object "appeal" and the beguiling qualities of panoramic paintings and other forms of visual display that produced the natural world in spectacular ways. But Gosse, writing at this time of changing understandings of vision and of the physiology and psychology of the eye, sets natural objects in a reciprocal relationship with an active viewer, rather than the passive observer that might be suggested by the idea of objects "appealing for attention."[76] Another mode of display that formed part of the technological context for Gosse's new ways of looking was the oxy-hydrogen microscope, which was used to project spectacularly enlarged visions of living animalculae. One popular display used by showmen and scientists from the 1830s involved projecting at enormous size a drop of the Thames secretly contaminated with stagnant ditch water to shock audiences with the monstrous creatures inhabiting their drinking water. The result was sensational, but Megan Kennedy stresses the ways in which the oxy-hydrogen microscope was employed not only to "magnify animalcules into grotesquerie" but also to develop life stories: "their operators also encouraged viewers to build narratives around the

animalcules, arousing an affective investment of identification and sympathy."[77] Here, then, was a display of life suspended in water that aimed, like Gosse, to give audiences a sense of identificatory connection with living characters.

The aquarium and its associated publications were the technological extension of Gosse's visual model for the *Sojourn*, aiming to engage the reader/viewer in a visual process of movement that would reveal the secrets of the sea. Indeed, the descriptive "succession of pictures" for which Gosse strives in the *Sojourn* is also the visual model for his subsequent works. The *Zoologist*'s review of Gosse's *A Naturalist's Rambles on the Devonshire Coast* (1853) noted that the work is "a fit companion to the 'Sojourn;' like that, it is a series of pictures which it must delight the lover of nature to look upon … the animals of the sea are here revealed to us in all their most attractive forms."[78] This "series of pictures" was also the model for the aquarium as a gallery of moving images. Gosse describes the "sea-mouse," for example, a bristly marine worm resembling a tiny rodent, seen in the aquarium crawling "restlessly to and fro," with brilliantly changing colours. Imaginatively altering the scene for his reader, Gosse illuminates the mouse with candlelight before moving to a discussion of obtuse and oblique viewing angles and the different colours they will produce when observed through glass.[79] Like the successive visual order in the *Sojourn*, Gosse's aquarium constructs a series of pictures for the reader – not only with descriptive aims, but in order to enable readers to reproduce them in material form in the construction of their own aquaria. The ability to change the viewing conditions of the aquarium could imitate the ever-changing conditions of the sea. It was with this sense of precise reproduction in mind that Gosse produced not only the drawings but also the lithographic plates for *Aquarium*, ensuring the accuracy of the colours.[80]

Just as the structure of vision and the visual structure of the *Sojourn* as a text are later developed in his work on the aquarium, Gosse's ideas about display can also be seen to develop from his Jamaican writings. The sea-mouse's colourful performance and Gosse's carefully adjusted lighting reflect the theatrical elements of the aquarium and the idea of fish espoused in the *Sojourn* as "little performers," a construction made in the context of Gosse's ethnographic ways of looking that place both people and animals as entities under scientific observation.[81] The popularisation of natural knowledge through theatrical and visual modes (such as the spectacular scientific demonstrations and the vivid personalities on the scientific lecture circuit as well as visual technologies such as panoramas and optical illusions) is nowhere more evident than in the home aquarium and its domestic production of colourful natural display.[82] Gosse's biographical model of natural history writing is also informed by his depiction of the Jamaican natural world as a scene of "romance heightened by the indefiniteness and obscurity in which it lay."[83] This romance is infused with a kind of naturalist's reverie as Gosse describes himself as "engaged, in dreams, in endeavouring to penetrate the darkness."[84] This state of scientific contemplation and the fascination with observational practices emerge in the spectacle of metropolitan aquatic theatrics, where the dream-like quality of underwater life is only multiplied when looking at it through glass. For Walter Benjamin, glass's transparency made it the "enemy of secrets."[85] In his Jamaican writings, Gosse anticipates his own work on the aquarium when he stresses the accuracy of vision afforded by glass technologies.[86] But while the aquarium's transparency made it the friend of natural knowledge, its glass boundaries denied the viewer a multi-sensorial experience of what lay

within it. Instead, Gosse's aquarium enacted a visual sensibility grounded in ideas about obscurity, revelation and performance, drawing as much on the conceptual models of theatre as it did on natural history.

The glass container itself was a central element of the aquarium's spectacular display. Gosse's octagonal design (the shape is key as the parallel sides prevent distortion) and its ornate pedestal [Figure 2], in particular, formed a display which drew attention to both its contents and its medium. As well as permitting 360–degree viewing, the octagonal design drew attention to the aquarium as aesthetic object in and of itself. Isobel Armstrong does not explicitly include the aquarium in her examples of the glass objects she associates with the modernity of nineteenth-century everyday life alongside "looking through a window, picking up a glass, posing for the photographer's glass plate."[87] Yet the aquarium was very much part of this middle- and upper-class modernity, becoming a focal point of many Victorian living rooms, and emerging in the era of mass production which Armstrong identifies in relation to a "dialectic of glass" that describes a particular set of ideas about watching and being watched which followed Bentham and his panopticon.[88] Connecting the domestic sphere to the imperial, Judith Hamera writes of American domestic aquaria that their capacity to house both indigenous and foreign landscapes and specimens meant that even the early aquaria hinted at "transnational fascinations and imperial anxieties" and that the "overall mission of the operation was a domestic extension of what Mary Louise Pratt calls 'the imperial eye' underwater."[89] Even without tropical specimens, nineteenth-century natural history's entanglements in the discourses of imperial rule could be viewed in miniature in the aquarium's management of an orderly aquatic empire. Indeed, the Jamaican prehistory of Gosse's own glass observatory connects the visual apparatus of imperial panoramas to the domestic display of the natural world. The development of visual ideas in Gosse's later works, begun in the *Sojourn*, reveals the significant connections between the Caribbean elements of his aquatic knowledge and visual models and his subsequent popularisation of aquatic collection and display in Britain.

A memorial of the sea

Gosse's *Aquarium* (1854) and *Handbook to the Marine Aquarium* (1855) were published almost a decade after his time in Jamaica but are firmly embedded in his experiences and the memory of the Caribbean, recalled in the *Aquarium* from the outset when Gosse couches his prefatory remarks in his fascination with the "idiosyncrasies" of individual specimens he encountered there.[90] Later, in the midst of describing collecting on the Dorset shoreline, Gosse laments the loss of memory from his time in Jamaica, which becomes "every year more filled with hiatuses of recollection, and more and more reduces itself to a general hue; lovely and empurpled, indeed, it will ever be." Yet, as the clarity of some experiences fade,

> here and there, along the line of retrospective glance, there are points and prominences, which seem as if they could never die, occurrences which are, as it were, burnt-in on the memory, and which the haziness of approximate scenes and incidents serves only to place in bolder relief; just as an increase of distance often makes more conspicuous the mountain peaks, which the proximity of a multitude of minor objects concealed or obscured.[91]

For Gosse, memory is a process analogous to vision – and indeed is probably a visual process that operates through the construction of "scenes." The aquarium works along the same lines: just as Jamaica is a place of "romance heightened by the indefiniteness and obscurity in which it lay," and just as memory emerges in the production of objects of "bolder relief" set against concealment or obscurity, the aquarium depends upon a theatrical visual model of obscurity and revelation, as animals peek out from behind plant life [Figure 6].[92] The significance of memory to natural history is also emphasised in Gosse's *Romance of Natural History* (1860–61), again specifically in relation to Jamaica, as Gosse secures the relationship between travel, memory and the production of natural knowledge by bridging his own Jamaican remembrances to "the impressions made on [Charles Darwin's] refined and poetic mind by the strange scenes of other lands."[93] Gosse's memorialisation of Jamaican aquatic life, and the impression that those tropical visions are present with him on the Dorset coast and in British aquaria, are part of his claim to authenticity, as his transatlantic experience helps him to assert the authority of the well-travelled naturalist. International environments are clearly not only a source of new species discovery, though. They also shape the natural historical imagination in a broader sense and determine the creation of British natural knowledge.

The aquarium participated in a larger constellation of visual productions in museums and other public exhibits such as panoramas and magic lanterns; considering the aquarium in relation to these displays invites questions about how the displacement of sea life from its original context changed how it was viewed. For Gosse, the aquarium was an invaluable instrument for learning about marine environments. Bemused by reports of the French zoologist Henri Milne-Edwards's underwater observations clothed

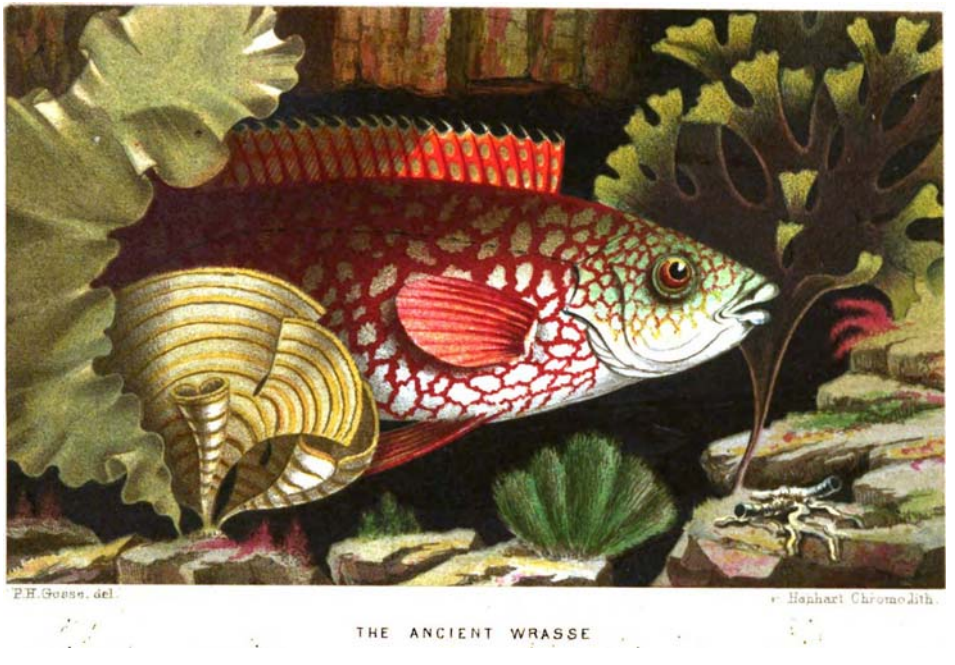

Figure 6. Philip Gosse, "The Ancient Wrasse," *The Aquarium: An Unveiling of the Wonders of the Deep Sea*, second edition (1856). Chromolithograph. Courtesy of the British Library/Google Books.

in a "water-tight dress, suitable spectacles, and a breathing tube," Gosse argued that this was an unnecessarily laborious method of viewing aquatic life that was likely to achieve only "feeble results."[94] In any case, such a madcap method of discovery was entirely redundant given that the technology of the aquarium provided more than sufficient opportunity to "make us acquainted with the strange creatures of the sea."[95] Jonathan Smith has described the aquarium as a mediation of or "stand-in" for nature, but Gosse stressed that the marine aquarium allowed people to view sea creatures in their natural environments.[96] For example, in the sea the serpula presents a colourful array of fans. Once lifted from the sea, however, it takes on a very different appearance: "you would probably look with little interest on these clumps of dirty-white, rough tubes, on seeing them come up in the dredge [net], but in an Aquarium few objects are more attractive."[97] Taking everyday Weymouth shoreline discoveries and reinvigorating them through the visual technology of the aquarium, Gosse indicates that the aquarium, as a space in which natural environments are reproduced, can be the best way to view specimens, inverting the value relationship between original and reproduction.

The aquarium's contents are probably fittingly described as one of the "chimeric" objects that exists between art and nature, such as those discussed by Lorraine Daston in *Things That Talk*. Daston's central examples include the astonishingly lifelike glass flowers produced by Leopold and Rudolf Blaschka between 1887 and 1936, which participated in the fashion for illusionistic art that tricks the eye for an instant. Before they started making glass flowers, the Blaschkas also produced over 10,000 glass models of sea creatures between 1863 and 1880, supplying museums and private collectors with detailed glass replicas of marine invertebrates. The aquarium is not quite an "artifact" in the same way as the glass flowers or sea creatures are, but it does take on something of the same "eerie verisimilitude" of glass models in the moment when the fact of its reproduction is revealed.[98] When a fish unexpectedly swims out from between the seagrass and appears to look directly in the eyes of the viewer as if through a window, it highlights the aquarium's artifice.

The aquarium's visual act of memorialisation captures the "imprint" of nature for both the domestic space of the parlour and the public space of the zoo. As Gosse puts it: "The delight we all feel in free, pure, wild nature is far too evanescent a thing; the business and care of life, the stern realities of 'this working-day world,' rub off the imprint too readily; let us stereotype it if we can."[99] For Gosse, the aquarium is a copy, rather than the original, but it is one that sets elements of the original in bolder relief. In this sense, then, Gosse's aquarium needs to be understood in light of Crary's argument that "certain forms of visual experience usually uncritically categorized as "realism" are in fact bound up in *non-veridical* theories of vision that effectively annihilate a real world."[100] Gosse's biographical microscopy is classically realist, to be sure, but the aquarium as a mode of exhibit which privileges the knowledge afforded by the "stereotype" also queries the prioritisation of the original constructed by realist media. In Gosse's writings, the aquarium represents a reproduction of the sea performed by presenting a visual "memory." Significantly, his invocation of Jamaican memories alongside British ones in his guidance for aquarists suggests that the aquarium represents a collection of visual memories informed by Gosse's work across different shorelines; connecting Poole and Weymouth to Bluefields and Savanna-la-Mar, Gosse forges a significant connection between marine biology in Jamaica and aquaria in Britain.

Looking at the aquarium through the lens of its Jamaican prehistory reveals some of the colonial, visual and natural historical origins of Gosse's ideas for British marine exhibits.

Regardless of the practical difficulties of transporting live aquatic creatures and plants, Gosse's work in Jamaica (and North America) fundamentally shaped the practice of natural history and the visual model he developed back in Britain. The aquarium was, in part, the result of Gosse's Jamaican collections and observations, and embodied his work to make both natural history and its display function as living practices that were part of everyday life. The aquarium brought life, movement and context to the display of sea creatures and plants. It embedded the contemporary fascination with modes of vision, and with the relationship between vision and movement, in a new technology that was structured by a variety of visual models. Firstly, as an archive of the living body, the aquarium's spectacle was created from both the British specimens it contained and the memory of Jamaican natural wonders which informed Gosse's display designs and structured his methods of natural historical observation. Secondly, a variety of types of vision – microscopic, panoramic, ethnographic, spectacular, theatrical – were at stake in the invitation to look at, into and through aquaria. Gosse's Jamaican work participated in a transatlantic process of visual production whereby metropolitan spectacular modes (embodied by displays such as the panorama, the magic lantern and the oxy-hydrogen microscope) were taken up in the colonies in order to produce knowledge about new species for the metropolitan reader, before being reformed in new metropolitan forms such as the aquarium. Conjoining microscopic forms of attention and proto-ethnographic narrative to spectacular display was Gosse's way of working towards his ideal of the aquarium as a living biography of both marine specimens and the sea itself. His racist commentary, delivered in proto-ethnographic terms, exposes some of the ways in which the racial structures of nineteenth-century Jamaica shaped natural history. Gosse's Jamaican work played a role in setting up the new kind of observers discussed by Crary, Nead and other historians of visual culture; this study shows that Gosse's ethnographic and biographic models of observation, developed during his circum-Atlantic travels, are evident in the British aquarium, revealing the significance of colonial Caribbean contexts to broader cultures of vision and display, as well as to natural history. Most importantly, Gosse's Jamaican manuscript shows the importance of Samuel Campbell and other Black collectors and naturalists, requiring us to look at the longer and geographically broader history of the aquarium's development, as well as at the racial and imperial structures in which natural history was produced. Connecting British domestic spaces and specimens to colonial Jamaican and North American natural history, the aquarium was in its origins a transatlantic visual production.

Notes

1. On his death, the Royal Society noted of Gosse that "no man has ever done so much to popularize the study of natural history in England." Cited in Thwaite, *Glimpses of the Wonderful*, xvii.
2. The aquarium was part of the Victorian domestication of natural knowledge. As Lynn Barber has written: "[b]y the middle of the century there was hardly a middle-class drawing-room in the country that did not contain an aquarium, a fern-case, a butterfly cabinet, a sea-weed album, a shell collection or some other evidence of a taste for natural history." Barber, *The Heyday of Natural History*, 13–14. Anna Thynne (1806–1866) has been credited with

opening London's first biologically balanced marine aquarium when she put her corals and sponges on public display at Westminster Abbey in 1847. See Adamowsky, *The Mysterious Science of the Sea*. Adamowsky writes that Gosse shares the merit for having coined the word "aquarium" with Robert Warington. Adamowsky, *The Mysterious Science of the Sea*, 115.

3. Edmund Gosse, *Father and Son*, 157. For an example of the work done to revive the importance of natural history to Philip Gosse's life and work, see Hamera, *Parlor Ponds*.
4. For example, Merrill, *The Romance of Victorian Natural History*. See also Smith, *Charles Darwin and Visual Culture*. Smith points to the tensions evident in Gosse's work in the context of the rise of Darwinism, 88–90. Gosse begins *The Ocean* (1846), the first of his many publications on the natural wonders of the sea, by stressing his efforts to "describe with some minuteness of detail, a few of the many objects of interest more or less directly connected with the Sea, and especially to lead youthful readers to associate with the phenomena of nature, thoughts of God." Gosse, *The Ocean*, iii.
5. See Thwaite, *Glimpses of the Wonderful*, 125; Thwaite's rich biography of Gosse focuses on his ornithological work.
6. See, for example, Smith, *Charles Darwin and Victorian Visual Culture*, 82.
7. T.W. Fyles, *Canadian Entomologist*, 17. Gosse's unpublished 'Entomologia Terrae Novae' as well as *The Canadian Naturalist* (1840) resulted from his travels in Canada.
8. Merrill, *The Romance of Victorian Natural History*, 195.
9. Thwaite, *Glimpses of the Wonderful,* 139.
10. Gosse, *The Romance of Natural History*, 274.
11. Gosse, *Sojourn*, 50. On the economic history of Jamaica in the emancipatory era, see Butler, *The Economics of Emancipation*.
12. Gosse, *Romance*, 272.
13. Ibid., 367. Original emphasis.
14. Gosse, *Aquarium*, 7. See Johnston, *A History of British Sponges and Lithophytes* (Edinburgh: W.H. Lizars, 1842).
15. Gosse, "A Voyage to and Residence in Jamaica from 1844–1846," 31.
16. Gosse, *Jamaica Studies, 1844–46*, 45.
17. Ibid., 15, 36, 42, 55, 56.
18. The binding appears to have been carried out by the British Library from the private archive of Gosse's Grandson, Philip Henry Gosse, Junior. There is an embossed title stamped on the spine with the ADD MS number. Inside the binding there is a label marked "ex libris Philip Gosse" with the pencilled note "Junior."
19. There are elements of the bound images that suggest the aquarium sketch could have been done in Jamaica: it is on a page which includes sketches of species found in Jamaican waters. The aquarium image is one of three from hundreds in the bound manuscript that does not clearly show Jamaican sea life and natural environments. Pages 43 and 44 hold images of what appear to be species native to British waters, a ballan wrasse, for example. On balance, it seems unlikely that Gosse sketched the octagonal aqua-vivarium with this level of detail 8–10 years before he published the image.
20. See also Stewart, *Gosse's Jamaica, 1844–45*, 192.
21. Gosse, "A Voyage to and Residence in Jamaica from 1844–1846," 20, 40, 60.
22. Ibid.," 104, 106. On one occasion, Campbell's voice makes it into the journal, when Campbell reports killing a suffering hummingbird "to save his life," "A Voyage to and Residence in Jamaica from 1844–1846," 37.
23. Gosse, *Birds of Jamaica*, 36.
24. Gosse to W.L. Mesman, 22 November 1880.
25. Gosse, "A Voyage to and Residence in Jamaica from 1844–1846," 13.
26. Gosse, *Sojourn to Jamaica*, 31.
27. Ibid., 235.
28. Ibid., 237.
29. Gosse cited in Thwaite, *Glimpses of the Wonderful*, 129.
30. Gosse, *Sojourn*, 215, 25.

31. Gosse, *Father and Son*, 73.
32. Merrill, *The Romance of Victorian Natural History*, 194.
33. Gosse, *Evenings at the Microscope*, 34, iii.
34. Gosse, *A Naturalist's Sojourn in Jamaica*, v.
35. Gosse, *Sojourn*, 4.
36. See Mullen and Littleton, *Philip Henry Gosse*, 9–10. Kyriaki Hadjiafxendi and John Plunkett attribute the public appeal of seaside studies to the value it placed on the local environment: "much of the influence of Gosse and [Charles] Kingsley was due to the fact that they promoted a new type of living natural history, one that was spatially oriented and not dominated by the naturalist's study or the taxidermied sample." Hadjiafxendi and Plunkett, "Science at the Seaside," 187.
37. Gosse, *Sojourn*, 8; *Romance of Natural History*, 197, 3. Original emphasis.
38. Gosse, "A Voyage to and Residence in Jamaica from 1844–1846," MS 39, National Library of Jamaica, 49.
39. Ibid., 60; *Sojourn*, 76. The green anole (*Anolis carolinensis*) has the ability to change colour from bright green to dark brown.
40. Gosse, *Sojourn*, vii.
41. Gosse, *Letters from Alabama*, 40.
42. Ibid., 40.
43. Ibid., 255.
44. Gosse, *Sojourn*, 93, 19, 101. In Lynda Nead's account, a sense of muscular mobility underpinned the new nineteenth-century understanding of vision, in which "the eyeball hardly ceases motion for an instant" – contrasting sharply with the earlier model of the eye as a "hollow ball that receives images of visible objects transmitted by rays of light." Nead, *The Haunted Gallery*, 30.
45. Nicol, "The Ecology of Science and Slavery," 198.
46. Gosse, *Letters from Alabama*, 253.
47. Ibid., 251.
48. Gosse, *Sojourn*, 57–58.
49. Ibid., 59–60.
50. For another example of Gosse's racialized accounts of fishermen see Gosse, *Sojourn*, 215.
51. Ibid., 20–21.
52. Gosse, "A Voyage to and Residence in Jamaica from 1844–1846," 62.
53. Ritvo, *The Animal Estate*, 248; Cowie, *Exhibiting Animals*, 87.
54. Rehbock, "The Victorian Aquarium," 531.
55. Adamowsky, *The Mysterious Science of the Sea*, 113.
56. The companion to the London Museum notes that sharks are "said to attack Negroes in preference to Europeans, and to attend with assiduity the slave ships from Africa to the West Indies." Bullock, *Companion to the London Museum*, 92.
57. Ibid., iv.
58. Ibid., 89.
59. Gosse, *Sojourn*, 34.
60. Ibid., 166.
61. Taxidermy practice had long involved draping an animal skin over a metal frame and stuffing it with hay or cotton, but by the time of the Great Exhibition in 1851, new techniques were developing rapidly and taxidermists competed to showcase new methods that would display specimens in the most "lifelike" manner. Because naturalists were dependent on examining preserved specimens in order to create taxonomic schema, taxidermy was crucial to addressing anatomical peculiarities and irregularities in decisions about whether a creature represented a new species, and where they should be placed in an animal order. The development of best practices was, therefore, seen as crucial to the success of the museological and zoological endeavour. On taxonomy and the preservation of specimens, see Ritvo, *The Platypus and the Mermaid*, 14.
62. Bullock, *Companion to the London Museum*, iv.

63. Cited in Adamowsky, *The Mysterious Science of the Sea,* 107.
64. Rehbock, "The Victorian Aquarium," 522.
65. Hibberd, *Rustic Adornments for Homes of Taste*, 122.
66. Gosse, *The Aquarium*, 6 and Philip Gosse, *Sojourn*, vii.
67. Rehbock, "The Victorian Aquarium," 531.
68. Gosse, *Sojourn*, 206–216.
69. "The aquativ vivarium at the Zoological Gardens, Regent's Park," 420.
70. Crary, *Techniques of the Observer*, 16.
71. Ibid., 3.
72. Gosse, *Sojourn*, x.
73. Comment, *The Panorama*, 7.
74. Gosse, *Sojourn*, 50.
75. Kember, Plunkett and Sullivan, eds, *Popular Exhibitions*, 10**.**
76. Gosse, *Sojourn*, 50.
77. Kennedy, "Throes and struggles," 87, 85.
78. *The Zoologist: A Monthly Journal of Natural History*, October 1853, 4054.
79. Gosse, *Aquarium*, 159–160.
80. Smith, *Charles Darwin and Visual Culture,* 77–78. Gosse learned basic painting techniques, and, importantly, the art of painting in miniature, from his father, who had received training at the Royal Academy and been taught by Joshua Reynolds. Mullen and Littleton, *Philip Henry Gosse: Science and Art*, 1.
81. Gosse, *Sojourn*, 82.
82. On examples of Victorian popular science and visual culture, see Lightman, *Victorian Popularizers of Science*. Hamera describes the American domestic fish tank as a "personal theatre," grounded in "dramaturgical and theatrical principles" and writes that while "Zoo animals are Stanislavskian. They invite emotional recognition. Aquarium residents are Brechtian. As Newberry suggests, their physiology, their physiognomy, and their very surroundings constitute built-in alienation effects." Hamera, *Parlor Ponds*, 8, 21.
83. Gosse, *Sojourn*, 19.
84. Ibid., *Sojourn*, 19.
85. Benjamin, *Selected Writings*, 734.
86. Gosse keeps a frog in a basin under a pane of glass "for facility of observation." Elsewhere, he notes the clarity of the Caribbean Sea: "[t]he water is so beautifully transparent that in 6 fathoms the bottom with every rock, patch of sand, or mass of weed, as distinctly seen as if seen through a broad plate of glass." Gosse, "A Voyage to and Residence in Jamaica from 1844–1846."
87. Armstrong, *Victorian Glassworlds,* 12–13.
88. Ibid.,11.
89. Hamera, *Parlor Ponds*, 78, 44.
90. Gosse, *Aquarium,* iv.
91. Gosse, *The Aquarium*, 152.
92. Gosse, *Sojourn*, 19; Gosse, *Aquarium*, 152.
93. Gosse, *Romance*, 175–77, 179.
94. Gosse, *The Aquarium*, v.
95. Ibid., v.
96. Smith, *Charles Darwin and Victorian Visual Culture*, 84.
97. Gosse, *The Aquarium*, 172.
98. Daston, *Things that Talk*, 22.
99. Gosse, *Aquarium*, 79.
100. Crary, *Techniques of the Observer*, 14.

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